

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1, 3, 6, 15 and 16 have been amended. No new matter has been added.

This amendment changes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-16 are now pending in this application.

Specification

The specification was objected to for minor informalities. The specification has been amended as suggested in the Office Action, thus overcoming the objection.

Claim objection

Claim 16 has been amended as suggested in the Office Action, thus overcoming the objection to that claim.

Rejections under 35 U.S.C. §§ 102 and 103

Claims 1-11 and 13-16 stand rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,279,116 to Shimizu et al. (“Shimizu”). Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimizu in view of U.S. 2002/0046562 A1 to Allansson et al. (“Allansson”). Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimizu in view of U.S. 2002/0053202 A1 to Akama et al. (“Akama”). Applicants respectfully traverse these rejections for at least the following reasons.

Independent claim 1, as amended, recites “a first deterioration diagnosing section diagnosing a deterioration of the exhaust aftertreatment apparatus on the basis of the first

and second ratios obtained under a first engine operating condition when the exhaust ambience is changed” and “a second deterioration diagnosing section diagnosing the deterioration of the exhaust aftertreatment apparatus on the basis of the second ratio obtained under a second engine operating condition when the first deterioration diagnosing section diagnoses that the exhaust aftertreatment apparatus is deteriorated.” Thus in claim 1, the first deterioration diagnosing section (1) diagnoses a deterioration of the exhaust aftertreatment apparatus on the basis of the first and second ratios obtained under a first engine operating condition when the exhaust ambience is changed, and then the second deterioration diagnosing section (2) diagnoses the deterioration of the exhaust aftertreatment apparatus on the basis of the second ratio obtained under a second engine operating condition when the first deterioration diagnosing section diagnoses that the exhaust aftertreatment apparatus is deteriorated. Shimizu does not disclose the combination of the first and second deterioration diagnosing as specifically recited in claim 1, where the second deterioration diagnosing is performed under a second engine operating condition when the first deterioration diagnosing determines that the exhaust aftertreatment apparatus is deteriorated, nor the advantages of this combination.

Shimizu merely discloses a device for determining a deterioration of a three-way catalyst by comparing first characteristic values obtained by a first characteristic values obtaining means with second characteristic values obtained by a second characteristic values obtaining means. Shimizu does not disclose or suggest that his first and second characteristic values means function to perform the diagnosing performed by the first and second deterioration diagnosing sections, respectively, as recited in claim 1. That is, Shimizu does not disclose that his first and second characteristic values means respectively perform the diagnoses (1) and (2) above where the second diagnosing is performed under a second engine operating condition when the first diagnoses determines that the exhaust aftertreatment apparatus is deteriorated.

Allansson and Akama were cited for allegedly disclosing other features of the claims and fail to cure the deficiencies of Shimizu.

Independent claims 15 and 16 respectively recite features corresponding to the first and second deterioration diagnosing sections of claim 1, and are patentable for at least the same reasons.

Moreover, Shimizu fails to realize the advantages of the two step deterioration diagnosing as recited in the claims. The two step deterioration diagnosing can enable an improvement in diagnosing accuracy, while at the same time suppressing the deterioration of fuel consumption in some embodiments. For example, dependent claim 14 recites “the first deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus on the basis of a change of a catalyst downstream side air/fuel ratio relative to a change of a catalyst upstream side air/fuel ratio during a rich spike control”, and “the second deterioration diagnosing section diagnoses the deterioration of the exhaust aftertreatment apparatus from an inversion cycle of a feedback quantity during the feedback control of the catalyst downstream side air/fuel ratio during a stoichiometric control when the first deterioration diagnosis made a deterioration determination.” In the first deterioration diagnosis during rich spike control, the diagnosis is easily executed without deteriorating engine performance. The second deterioration diagnosis, which is performed only after the first determines deterioration, is during stoichiometric control, and provides a greater accuracy in diagnosis. Thus, the combination of the two diagnoses in this instance suppresses the deterioration of fuel consumption, while at the same time enabling an improvement in diagnosing accuracy. This advantage is nowhere realized by the Shimizu system.

The dependent claims are patentable for at least the same reasons as independent claim 1, from which they all ultimately depend, as well as for further patentable features recited therein.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date January 13, 2006

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